

Surgeon General's Office

Surgeon General's Office

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No. 21364





AN

ESSAY

ON

CANTHARIDES:

COMPRISING,

A BRIEF ACCOUNT

OF THEIR

NATURAL HISTORY;

AN

INQUIRY

INTO THEIR

Mode of Operation,

AND

THEIR USE IN DISEASES:

WITH

SOME REMARKS

RELATIVE TO THE
TIME WHEN THEY SHOULD BE EMPLOYED.

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By JOHN PARKER GOUGH,

OF CHARLESTON, SOUTH-CAROLINA,
MEMBER OF THE PHILADELPHIA MEDICAL AND CHEMICAL SOCIETIES.

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Phæbe fave, novus templa tua ingreditur.

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PHILADELPHIA:

PRINTED BY WAY & GROFF, No. 48, North Third-street,

1800.

INAUGURAL THESIS

DOCTOR OF MEDICINE

NATURAL PROTECTOR

EXAMINATION

Mode of Operation

SHREARIN WINGSTO

TRUSTEES WANDER TOURS

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THE THE PROPERTY AND ALTERNATIVE CO. S.

Onther hills of hear 1800.

INAUGURAL THESIS

FOR THE DEGREE OF

DOCTOR OF MEDICINE.

SUBMITTED TO THE

EXAMINATION

OF THE

REV. JOHN EWING, S. S. T. P. PROVOST;

THE

TRUSTEES & MEDICAL FACULTY,

OF THE

UNIVERSITY OF PENNSYLVANIA,

On the thirty-first of May 1800.

BENHAMUERREN MARIETE

TO THE PROPERTY AND OF THE STATE OF THE STAT

DOCTOR OF MEDICINA

DEAR SIR,

DID no cyny Krietky of the to you, your maintain, prompt a dedication of this to you, your minence in public, and your virthis in private life, to aid alone demand, this tribute of volged, to your laws. But imprefied, Sir, as I am, with a fively cale of your favours, I could not forego the present of your favours, I could not forego the present of my feelings, and of dedicating this the cent of my feelings, and of dedicating this the first clay of those advantages? derived from your first clay of those advantages? derived from your first than the falletting your perfect the those your post of the home falletting your post of the home falletting your post of your notice. "It is not such as I wished but lach as I have been able to make it."

Lour candour, therefore, will look with indul-

BENJAMIN RUSH, M.D.

PROFESSOR OF THE INSTITUTES AND OF CLINICAL MEDICINE,

IN THE UNIVERSITY OF PENNSYLVANIA.



DEAR SIR,

prompt a dedication of this to you, your eminence in public, and your virtues in private life, would alone demand this tribute of respect to your talents. But impressed, Sir, as I am, with a lively sense of your favours, I could not forego the present opportunity of making a public acknowledgment of my feelings, and of dedicating this the first essay of those advantages I derived from your instructions, while I had the honour of being your pupil. In thus soliciting your patronage, however, I do not slatter myself with presenting you any thing worthy of your notice. "It is not such as I wished it, but such as I have been able to make it."

Your candour, therefore, will look with indulgence on the attempt, and credit me for the affurance of my wishes, that it was equal to the high respect entertained for your character. Accept, Sir, my affectionate regards, and permit me to subscribe myself

From word during of the dance in this cities in

Your friend and pupil,

J. P. GOUGH.

BENJAMIN SMITH BARTON, M. D.

Professor of Materia Medica, Natural History and Botany,

IN THE UNIVERSITY OF PENNSYLVANIA.



SIR,

I TAKE a pleasure in inscribing this to you, as a public testimony of the high respect I entertain for those talents which will justly acquire you the honour due to merit; and as an acknowledgment of the friendly attentions I have received from you, during my residence in this city.

With fentiments of esteem,
I am, Sir,
Your friend and obedt. fervant,

J. P. GOUGH.

BENJAMIN SMITH BARTON M.P.

PROTESSOR OF MITTERIA MEDICA, NATURAL HISTORY CENTRAL CENTRAL CAROLINA.

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My much respected tie-

SIR. PERMIT me also to testify my high sease of your powers telepteriend ideposition inferiors inferior to the properties of the properties of the properties of the properties of the test test test to the properties and test test problems and test test problems and test test proud, init ever warm one breathest of the present of the pr

Your very fincere friend

Vom Gend and Alen COUCH

TUCKER HARRIS, M. D.

OF

CHARLESTON, SOUTH-CAROLINA.



My much respected Sir,

PERMIT me also to testify my bigh sense of your worth, talents, and deportment in life, by inscribing to you the following pages. And be assured, Sir, that the recollection of one, under whose care I commenced my medical pursuits, and of whose friendship I feel proud, will ever warm the breast of

Your very fincere friend

And former pupil,

J. P. GOUGH.

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INAUGURAL ESSAY

ON

CANTHARIDES, &c.

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HE effects of diseases on the animal economy naturally lead to an application of those medical principles which were taught to man by accident, or by analogical deductions. The investigation therefore of the properties of natural bodies, confequently became an object of his attention and inquiry. In proportion as civilization advanced, difeafes, by affuming new aspects, required more powerful remedies than those with which he was acquainted. He extended his pursuits beyond the narrow limits of common observation; nor was he fruitless in his refearches. The introduction of cantharides into medicine, opened a new field of fuccess to the practical physician; and marked a fortunate era in the annals of our art. For though much has been faid of their inefficacy, and of the ill effects of their application, time has not destroyed our confidence in their virtues. And indeed, were we to carry our researches into the multitude of articles so various and important which nature subjects to our knowledge, I know not if any could be found more deferving of attention, or of more extensive utility in the practice of medicine.

Cantharides were known to the ancients; but the kind they used is very different from the common meloe, of which they appear to have been ignorant. It is the meloe chichorei of Linn. they were acquainted with; which Dr. Barton thinks, is greatly refembled by the potatoe fly of our country. It is fomewhat furprifing, however, that they had no knowledge of their property of bliftering, until long after Hippocrates flourished. The first accounts of their use in diseases we have in the writings of the Arabian physicians, who employed them as incitants or stimulants in affections of the apoplectic class. Aretræus Cappadox, a person of learning and judgment, who lived, it is faid, a little before Galen, is entitled to the credit of first introducing these infects into medicine as an article of the materia medica. His method was to rub them on the head until a blifter was produced; but this is now very properly laid afide. It appears probable, that accident gave rife to the discovery of the vesicating quality of cantharides—inductive reasoning consequently arose—experiments were instituted—and experience finally gave a fanction to their efficacy.

The cantharides now in general use are called Spanish slies, from the circumstance of their having been formerly brought from Spain; but they are now met with in many countries of Europe. The

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largest and best are brought from Italy. A species of cantharis, as I have already hinted, has lately been discovered in the United States, equal if not fuperior to that which is imported. The first account of them that appeared, was in the Medical Repository of New-York by a Dr. Chapman. This infect has no refemblance to the meloe vesicatorius except in shape: its colour being far different, and its fize in general fmaller. The head is inflected, and of a brownish red, with two dark spots inclining to black of a femilunar form on its top. The antennæ or feelers are black, and appear upon close inspection to be formed of many joints. The tark have five articulations. The mouth is armed with jaws and supplied with palpi. Their elytræ or wing cases are black, having a pale yellow colour at their margin, and one in the middle; though I have fometimes feen two. The inner margin of each elytra has not fo wide a streak of yellow as the outer; but when brought in apposition to the other, is full as wide, and makes a middle stripe. If the elytræ and the wings be removed, we fee on the back a most beautiful yellow colour, with a dark shining line about the twelfth of an inch in diameter, extending along the middle. But if the body of the infect be pulled out, this apparent line is found to be shining dark spots of a quadrangular form, intersected by the yellow colour. This yellow colour in the male is not fo brilliant as in the female. If a parallel line be drawn from between each of the

fpots just mentioned, we find, near where the yellow is terminated by the under part of the body, five dots disposed in a row. These dots I could not find in the male. The hard white fubstances in the abdomen, discovered by Dr. Chapman, are only to be found in the females. The females are much larger than the males; and their bodies project confiderably beyond the elytræ: whereas the body of the male is nearly covered by the wing cases. The body, in both fexes, feems to be formed of folds protruded one within the other. This is rendered perceptible when extension is employed: for then four transverse grooves or sulci are discoverable on the abdomen, which were before hid by what appear to be hairs of a dusky-ash colour that clothe this part. The wings of these insects are considerably longer than their bodies; but when drawn in, are fo folded at their extremities, that they are eafily covered by their cases. They have a peculiar faintish, pungent smell, and become darker coloured by drying. Dr. Chapman found the effluvia from them fo acrid, as to create an uneafy fenfation in his head and nostrils. He recommends them to be dried in the shade, as more of their active properties might thereby be retained. These insects are principally found on potatoe vines; the leaves of which they are very fond of. Dr. Chapman found them also on beets and garden purslain. I have found them on the clover in meadows, when the leaves of the potatoe begin to be deprived of their fucculency.

It appears from some experiments the Doctor made, that every part of the insect is equally endowed with a vesicating quality. Dr. Woodhouse has discovered two other species of this sly.

The vesicatorius, or the common blistering meloe. is the fecond species of the insects of the genus melos in zoology, of the order coleoptera. It is an infect of the beetle kind, nine or ten lines in length, of a shining golden green colour, mixed with azure. The antennæ are jointed, the last joint being oval; the breast is somewhat round; the elytræ soft and flexible; and the head inflected and gibbous. It multiplies greatly. They are fometimes feen flying in fwarms. They are destroyed by the fume of vinegar. They have a strong nauseous smell, that is, when they are fresh, similar to the smell of liquid pitch. It is this peculiar fcent which leads to a difcovery of them when fought for. It is faid, that when disturbed at night by the approach of an enemy, the trees on which they rest appear as if illumined by fire, fo resplendent is their apparel. They are possessed of great levity, so much so that fifty of them scarce weigh a drachm. When tasted, a pungent flavour is foon communicated to the tongue and fauces; and, according to some writers, the effluvia from them is very acrid: but this feems to diminish with their age; at least if I may form a judgment from what takes place in the bliftering fly of our country. Their virtues probably depend, in some measure, upon this volatile principle: hence

the reason, why the American cantharides more certainly and more quickly induce vesication, than those which are imported, as appears from some comparative experiments instituted by a friend of mine. Newman says, they are sound chiefly in the spring season, and on ash and poplar trees; the former they seem to prefer. Cantharides, if preferved, in a few years appear to suffer a spontaneous decomposition. They are reduced into a sine powder.

There are many other species, differing in size, sigure and colour. Nature has clothed almost all of them, in a splendid manner. Green, azure, together with a golden hue, render them dazzling to the sight. In this genus, as well as in some others, the semales, it is afferted court, and in the act take the place of the males. The semales deposit their eggs in the ground; whence proceed larvæ, which pass through the chrysalid state, in order to attain that of meloes.

The first effect of the application of cantharides, to the surface of the body, is a sensation of itching.* This seems to be the universal consequence of a blistering plaister, and most probably depends upon the mechanical stimulus of the slies. When it does not occur, it may be ascribed to a want of sensibility

^{*} Bilifters in some persons, often produce an eryspelatous affection, refembling the netrie-rass. I have known one instance of the kind, in which the application of a blisser, was always followed by this eruption. It was relieved, and finally removed by washing the part with a solution of sacebarum saturni.

on the cuticular furface. If the cantharides be permitted to remain, inflammation is excited; and, in the course of eight or nine hours, an effusion of ferum from the exhalent veffels takes place, beneath the cuticle, that is termed a blister. And this effect they always produce if applied to parts, the fenfibility of which still remains unimpaired by the action of disease; for cantharides, when employed in fuch circumstances, scarcely ever excite a vesication of the skin, unless the system, by proper remedies, has been reduced, if above, and brought up, if below, to what may, with propriety, be denominated the point of sensation, or what I shall hereafter call the blistering point. This property appears to reside in every part of the fly; and is equally extracted by a spirituous and watery menstruum. But the former is thought the best preparation for internal use: an opinion that does not appear founded on accuracy of observation. The dose of cantharides in powder, may be from one-fourth of a grain to fix grains; and of the tincture, whether watery or spirituous, from five to fifty drops, bis die. beginning with a finall dofe, and gradually increafing it, a much larger quantity may be given. if an overdose of cantharides be taken, a discharge of blood, by urine, with exquifite pain follows, fucceeded by an inflammation of the whole intestinal canal; the stools become mucous and purulent; the breath fatid; intense pains are felt in the hypogastrie

region; the patient faints, grows giddy, and expires delirious.

There are many articles, belonging to the vegetable kingdom, that likewise possess this vesicating quality; but the discharge induced by them, is less plentiful, than that which is effused by the action of cantharides.

Does cantharides exert any effect upon the urinary fystem, inducing diuresis? This question seems to have divided the opinions of medical men. Dr. Cullen, and Dr. C. Smyth, are inclined to deny any fuch power, while others of equal respectability, affert its efficacy in this respect. It is certain that cantharides were employed by the ancients for this purpose, long before they were used or known as vesicatories. Hippocrates, the great father of medicine, gave the fly in fubstance as a diuretic; and many writers of modern date, have exhibited the tincture with the fame intent, for the cure of many diseases, more particularly of dropsies. In one instance, I thought I found the tincture evidently diuretic. Upon the whole therefore it appears, that cantharides are possessed of a diuretic property; and in the support of this opinion, I am happy in having the testimony of Dr. Barton, who, in his lectures, inculcates his firm conviction of their powers, in inducing diuresis. Dr. Jackson alfo, whose name justly stands high in the medical world, coincides in the opinion.

Is the action and mode of operation of blifters, directly on the skin, or by the absorption of their stimulating particles? A great diversity of sentiment exists also on this head, some contending for the former, while others endeavour to support the latter opinion. This collision amongst physicians, may be readily determined by observations, deduced from an attention to their effects upon the human economy. I shall with deference endeavour to elucidate this point, by offering the refult of fuch reflections on the subject, as have occurred to me. The action of blifters, feems to me to be only referable to a local irritation on the extremities of the capillaries. This action does not appear to be extended to the absorbing vessels, at least in an equal degree: if it did, I can readily conceive, that no blister would be the consequence, because, as soon as the ferum was discharged by the extreme vessels, the absorbents would take it up. The circumstance of ftrangury, being induced by an epifpastic, cannot be advanced as an objection to this opinion; for we well know, that from a law of fensation, motions or impressions made on one part of the body, excite motions and fenfations in another. This may be illustrated by the datura stramonium, or James-town weed, which it is faid, when applied to buboes produce convultions-now here is impression on one fystem, and action in another. Certain it is, that there feems to be a peculiar relation or affinity fubfilting between medicines and the different fyftems of our animal frame.* This opinion is very strongly inculcated and very ably supported by the learned Professor of the Materia Medica. The same explication, therefore, may be extended with evident propriety to account for the effects of cantharides when applied to the body, without recurring to the process of absorption. That strangury then should depend upon a peculiar irritation induced on the furface of the skin, by a blistering plaister, is not more extraordinary, than that tartar emetic, when rubbed into the palms of the hands, should excite vomiting; or that fneezing should be produced from certain errhines being taken into the stomach.† If the powdered root of white hellebore, (the veratrum album of Linn.) be applied to any fore, it excites nausea and vomiting. The same effect very frequently refults from the application of tobacco. In these cases, as the affection of the stomach is almost immediate, it can only be explained upon the principles just laid down.

But further; if the occurrence of firangury, after the application of blisters, depended upon the absorption of the acrid particles of the flies, furely this symptom would not only invariably ensue, but

^{*} Dr. Rush has divided the body into several different systems. This division appears to be established on very just principles. Might it not be adopted for a new arrangement of the Materia Medica, according to the action of medicines on each system?

[†] The honey which the bees prepare from the flowers of the kalmia latifolia, when swallowed, excites sneezing.

would take place in a little time after they were applied, as we know absorption to be continually going on in the human body; whereas, it is undeniable, that frangury does not always take place, and when it does, it is not, I believe, till after fome time has elapsed.*

Again: if this symptom be referable to the principle of absorption, it should be in an equal ratio, in point of violence, to the fize of the bliftering plaifter, and to the time allowed it to remain on; neither of which circumstances, I have ever found to take place. Perhaps it may here be asked, how then shall we explain the fact, that strangury is prevented and relieved by large draughts of water and other liquids. In answer to this, I must candidly acknowledge my ignorance; but at the fame time must beg leave to observe, that the explanation generally offered, of its washing away the cantharides from the coats of the urinary veffels, appears too unphilosophical to be admitted as a solution of the question. The opinion I have endeavoured to advocate, will perhaps derive some support from the fact, that the fymptom of strangury is not peculiar to cantharides. Many substances produce it. The folanum, or night-shade, for example, not unfrequently produces it. It is also the consequence some-

^{*} Strangury is not unfrequently a fymptom of fever. It fometimes occurs in the influenza. It is very probable from this circumstance, that fuch an affection is often ascribed to bliftering, when, in sact, it is symptomatic of general morbid action. If it occur, in either case, it is considered as a favourable indication.

times, of the exibition of nitre. Opium is faid to produce it; and camphor, according to Dr. Heberden, will as certainly excite strangury as cantharides.

From what has been faid, it may readily be conceived there is nothing specific in the action of cantharides, as relates to their usefulness; and that the fymptom induced by blifters may be rationally accounted for without calling in the aid of absorption. When they produce ill effects, it is folely by their flimulus on the skin communicating impression thro' fympathy, to other parts of the vascular system: hence they quicken the pulse and occasion thirst, &c. &c. I have faid that there is nothing specific in the action of cantharides: on the contrary, the cure of distortions of the spine, of white swellings, of local pains, and other complaints, by means of fetons, caustics, sinapisms, and applications of a similar nature, is to be explained on the same principles as blisters. They invite morbid excitement to an external part; keep up a serous effusion; and by their stimulus exciting new impressions, thereby weaken and transcend diseased action in other parts of the body.

This is the explanation I would give of the mode of operation of blisters. It is upon these principles I would refer their good effects, when properly applied. The first of these positions may be exemplished by the circumstance, that ulcers, whether the effect of a morbid constitution or of art, seem the best appropriated as preservatives against the action of the external agents of disease. This is an observa-

tion of the first practical writers. During the great plague in London, Dr. Hodges found, that whenever he was exposed to the contagion of the disease, he experienced great pain from a seton he had in one of his legs.

This determination of action to this weakened part, probably was the means of preferving his life. Dr. Gallagher, I was informed by Dr. Rush, ascribes his escape from the yellow sever, during its prevalence in 1797 to his creating and keeping up an artificial excitement on his wrists, by means of perpetual blisters. It is upon this principle also, that blisters are sometimes applied to the extremities in cases of irregular gout, in order to reinvite the morbid action to its primary seat.

Dr. Cullen does not ascribe much to the discharge from blisters; and indeed seems to think indisserently of their powers, whether as stimulants or evacuants. It must be confessed, that much cannot be expected from this last, except in local affections, and perhaps in some hydropic cases, when by decreasing the quantity of the essuade shuid, the absorbents recover their tone, and resume their wonted action. But their essicacy appears, in a great measure, if not wholly, to depend upon the stimulus, or new impression which they excite, when timely employed. Dr. Percival, if I recollect rightly, seems to be of the same opinion. This is more particularly illustrated by the great usefulness of blistering in nervous diseases, and in the low states of sever. It is there-

fore by keeping this in view, and regulating the state of the system accordingly, that we are to look for advantages from the application of blisters.

The proper time of applying blifters, has been a fubject of fome inquiry and controverfy. This however depends, as is evident from what has been faid of their mode of operation, upon the flate of the fystem. It is from an inattention to this circumstance, as has been justly observed by Dr. Rush, that there have been so many disputes among physicians respecting their efficacy. When applied in a state, says he, of great arterial action they do harm; when applied after that action has nearly ceased, they do little service.

Hence blifters are most serviceable in those cases of fever, in which there is not too great an increase, nor too great a diminution of what has been termed excitement. The reason, therefore, why ill effects have been ascribed to the use of blisters is sufficiently obvious. They arise from an untimely application. For blisters may be employed with advantage in all fevers, provided they are applied at the blistering point: that is, after the phlogistic diathesis of the system, has fo much abated by depleting remedies, that the irritation produced by them on the skin, so far from proving a stimulus to the complaint, will rather ferve to counteract the excitement existing in other parts of the fystem, and thus act revulsively, giving a centrifugal determination to the force of the difease, and thereby faving parts effential to life.

To accomplish this purpose, they should never be employed in highly inflammatory fevers, until the third or fourth day; and not even then unless the fystem has been reduced, because the excitement in fuch cases is most commonly too strong to be divided or overcome by the action of epispastics. And hence the reason that blisters, when applied without premifing depletion, and reducing the fystem to what I have already called the bliftering point, in diseases of great action, scarcely if ever rise and fill. And if they do, the state and discharge of the matter is fuch, as ever to afford to experienced nurses a pretty just conjecture of the different degrees of malignity in the fever. The preceding obfervations derive no inconfiderable weight from the testimony of Dr. Huxham, who has incontrovertibly established the impropriety of blistering in all cases where there is a tendency to much inflammahave been afcribed to the ute of history is fulficie, noit

But in fevers of moderate action, blisters, after gentle evacuations, may be employed with safety and advantage on the second day of the disease. They are particularly serviceable, when the patient becomes languid, or comatose in the more advanced state. In those cases, however, where severs of a highly inflammatory grade, from their long continuance, or from other circumstances, have assumed or approached to the typhus state, blisters are one of the principal remedies, and should be employed without much regard to the depleting plan: indeed

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in fuch cases, the system labours under so great debility, as to preclude the propriety of using evacuations, unless to a very moderate degree, and at long intervals of time; and then only in the indirect state that sometimes takes place in severs of this class.

To derive the greatest advantage from the use of blisters, it appears best to apply them one after another; fo that as foon as the first ceases to discharge, a fresh one should be applied. In confirmation of this, it may be observed, that generally when a blifter begins to dry, as it is termed, the fymptoms of the complaint become aggravated, but are relieved by the operation of the next: hence the propriety of fucceeding one by one. This willferve to illustrate what I advanced relative to the good effects of blifters depending greatly, and almost wholly, upon the stimulus or impression which they excite. Greater benefit feems commonly to be experienced from blifters, when applied to the most sensible parts of the body, as on the inside of the arms, thighs, and legs; though, if any symptom in a particular part should require it, a blistering plaister may be usefully applied there.

Would not the use of blisters be attended with more success, if applied, when practicable, to those parts, between which and the diseased, there may exist a greater sympathy, than between them and other parts of the system? Is not this opinion substantiated by the fact, that blisters, when necessary in small-pox, are more serviceable if applied to the

inoculated part? And does it not receive additional fupport from this, that when epilepsies arise from an uneafy fenfation in the arm or leg, a blifter applied there is the most effectual remedy? The celebrated John Hunter feems to have had some idea of vesicating substances curing diseased parts, when applied to others in sympathy with them. "I can even suppose, he says, a local disease cured by sympathy and by that medicine which would increase it, if applied immediately to it. Let us suppose, for example, any difeafed mode of action, and that this mode would be increased by some irritating medicine if applied to it; but apply this irritator to fome other part which this difeafed part sympathizes with, and that the sympathetic act in the diseased part shall be the same as if its specific irritator was applied: then, in fuch a cafe, the medicine would cure by fympathy, although it would increase the difease if applied locally, or have no effect at all." In affenting, however, to this opinion, I do not mean to infer the universal application of epispastics to fuch parts in sympathy. For example, I do not fuppose, that in cases of hepatitis, a blifter to the shoulder would be so efficacious as when applied over the affected part. But it may be observed, on the other hand, that an attention to fuch connexive influences in bliftering promises to be of some utility. Hence probably it will be found, in the course of practical observation, that in all stomachand bowel complaints, but more particularly the

former, blistering the feet or legs will be attended with more benefit, than blistering other parts of the body.

Having thus given a history of the cantharides, and endeavoured to shew, that the symptom of strangury does not depend upon absorption-having also pointed out the proper period for the employment of blifters, and attempted an explanation of their mode of operation-and having made fome defultory observations relative to their sympathetic influence, let us proceed in the next place to speak of the use of epispastics, in some particular diseases. And first, in intermittents. To the efficacy of blisters in fevers of an intermitting type many respectable writers bear testimony. Dr. Lynd in particular recommends the use of bliftering in obstinate intermittents. The application of blifters in diseases of this class has been found to render the fuccess of the bark still more certain. In intermittents, when the bark had before been given without avail, I have feen a large blister, between the shoulders, of the greatest utility in affisting its operation. And Dr. Rush affures us, that in all those cases of autumnal intermittents, whether quotidian, tertian or quartan, in which the bark did not fucceed, after three or four days trial, he had feldom feen it fail after the application of blifters to the wrifts. This observation is of great importance; for it will probably be found, that the failure of the bark in intermittents and other diseases can almost always be ascribed to

its being exhibited when an undue action prevails in the fystem. In such cases, therefore, previously to the use of the bark, blistering promises to be of the most effential service, as a considerable force of the difease is thereby concentrated to an external part, and the fystem consequently rendered more fit for the power of the bark. The constant heaviness of the head occasioned by tertian fevers, and those head-achs, which often take place after an intermittent has ceased, are best relieved by the application of a blifter to the neck. Might not the recurrence of a fecond paroxysm of an intermittent be prevented by the timely application of a blifter to the neck, without having recourse to the tedious use of the bark. A case of this kind, which came under my knowledge, feems to warrant the experiment. Dr. Barton thinks that finapifms, from the circumstance of their being more painful than blifters, would prove more powerful in destroying the affociation of intermittents.

Blisters have been also successfully employed in the cure of the remittent fever. But they should never be used, as the judicious Dr. Lind observes, till the fever has been of long continuance, or the spirits and pulse of the patient has begun to slag. The disease soon suffers a remission after their application. Dr. Rush in his account of the bilious remitting fever of the year 1780, informs us, that he always had recourse to blisters, if the sever did not intermit after the third or fourth day. They seldom failed of

producing an intermission in the fever the day after they were applied. He thinks more immediate good effects were derived from bliftering the neck, and behind the ears. In the remitting fever, which prevailed at Portsmouth and the adjacent country, Dr. Lind found a blifter to the back of great efficacy in relieving the violent head-ach that most generally accompanies, and is peculiarly distressing in this difease. He often obtained a perfect intermission by the application of a blifter to the back, and the exhibition of fome sudorific medicine. When, favs he, the head-ach and giddiness were very violent, and the pulse neither full nor strong, I ordered a blifter to the back, and endeavoured to reduce the fever into an intermittent form, by giving half a grain of tart. emetic, with a few grains of nitre every fix hours. Thus a perfect intermission was often obtained, and the bark was then administered without delay. A blifter to the back feldom fails to relieve that acute pain in the head, which fometimes afflicts patients during the remission of the fever.

Of the utility of blisters in the yellow sever much can be said. They, without doubt, do essential service in this disease when judiciously applied. And they certainly obviate greatly the affection of the stomach, and create a diversion of the excitement from internal parts. I would prefer their application to the extremities, for reasons already assigned; but Dr. E. Miller, in his valuable paper on the analogous essects of morbid poisons and malignant

diseases, published in the Medical Repository of New-York, seems to expect greater benefit from them when applied to the pit of the stomach. Blisters, says he, are entitled to great considence when applied to the epigastric region for the purpose of relieving the local disease of the stomach; but they are generally resorted to at too late a period. They seem better adapted to obviate the incipient affection of the stomach, than to restore the exhausted powers, or to arrest the decomposition which takes place in the advanced stages.

Dr. Rush, whose experience in this disease has been great, and whose talents for observation are equally striking, speaks highly of the use of blishers. But he never employed them until the sever was so much weakened by depletion, that the pain induced by their stimulating power, destroyed, and, like a conductor, conveyed off all the natural pain of the body. The effects, says he, were as follow:

First, They concentrated, like a salivation, all the scattered pains of the body, and thereby; secondly, reduced the pulse in sorce and frequency. Thirdly, They instantly checked a sickness at the stomach and vomiting; and sourthly, They often induced a gentle moisture on the skin.

The use of blisters, however, has not been universally admitted in the yellow fever. Dr. Hillary reprobates, in the strongest terms, the practice of blistering in this disease; and affirms that he has seen the place where a blister was applied, turned

perfectly black, and sphacelated. But the ill effects which he observed to arise from epispastics, sufficiently evince the *state* of the system in which they were applied; and tends to establish what has been already noticed, that such applications are inadmissible in highly inflammatory diseases, unless previous evacuations are used, so as to reduce the system to that point, in which they may be employed with the most advantage.

Of the use of blisters in the plague, I know nothing; but judging from the principles laid down in a preceding part of this essay, I have not the least doubt of their proving essicacious, particularly when attended with coma.

Blisters in nervous diseases are greatly to be relied on. They stand first in the prophylactic list, and should be early employed:—they are of manifest fervice in the typhus mitior, of Dr. Cullen, or slow nervous fever. In the typhus gravier, or that state of fever which is improperly denominated putrid, blisters are highly valuable; and in the first formation of the disease, when preceded by some depleting remedy, have been known to remove the disorder. A blister to the back has been found to remove the head-ach and thirst, and to make calm the pulse in this fever. Dr. Lind has related several cases in which they proved very quickly efficacious, in obviating the oppression about the precordia, &c.

In those affections of the alimentary canal, defignated by the names of cholera morbus, dysentery,

colic, and diarrhæa, blifters cannot be too much commended. They fpeedily relieve those distressing fymptoms which accompany these diseases. The early application of them does not appear unadvisable, provided there is not an undue action in the fystem, as indicated by the pulse.

In cholera morbus and dysentery, the application of blisters should never be omitted. They considerably lessen the pain and spasm, however excruciating, by a diversion of it to another part. In colic, they afford quick and certain relief; and it has been observed by some writers, I think, that very soon after their application, purgative medicines have more certainly produced their essentials.

In diarrheas, particularly of the chronic kind, blisters are greatly to be depended upon. I have feen the most happy effects from their use. Dr. Rush has found them of very effential benefit in such complaints. He advises their application to the inside of the thighs or legs.

Blisters have been highly spoken of, and have often succeeded in the cure of dropsies, after all other means have failed. Great advantages have been derived from their application in hydrothorax. They considerably lessen the discharge of water, and greatly obviate the distressing dyspnæa which accompanies this disease. Writers recommend their application to the breast.

Blisters are equally serviceable in anafarca. In the hydrocephalic state of sever, they have been employed with much success. Their application to the extremities appears most desirable. Dr. Dawfon recommends them to be applied behind the ears. During their action all the symptoms are mitigated, and patients not unfrequently recover by their application. Mercury is frequently exhibited in all the varieties of dropsy, with an intent to excite ptyalism, though inessectually; in such cases, its operation may be greatly assisted by a blister.

Indeed, I might digrefs here and observe, that in all those cases in which it is the object of the practitioner to produce a falivation, and he has been baffled in his attempts, his wishes may almost always be accomplished by blistering some part of the body. This opinion is supported by the obvious advantages, that arise from the use of epispastics in preparing the fystem, as it were, to take on mercurial action, in the treatment of the yellow fever, when it is thought advisable to create a discharge of faliva. This was frequently noticed by my worthy Preceptor. The blifters, to accelerate this effect, should be dreffed with unguentum bydrargyri. They feem to act in two ways: 1st. By exposing a surface for absorption: and 2dly, By lessening plethora, and probably thereby taking off the congestion, or rather torpor under which the absorbent system sometimes labours. This explanation may be fully elucidated by a reference to the great efficacy of blisters in the treatment of what we have been just speaking of.

In the different species of angina or cynanche of Dr. Cullen, blisters, according to the severity of the symptoms, should be applied to the back, or behind the ears; though greater benefit seems to be derived from the application of one to the throat. This practice is fanctioned by the authority of the celebrated Sir John Pringle, who besides commending one to be applied to the back, advises another to be laid across the throat. Blisters however should never be used until after the employment of depleting remedies; then apply one between the shoulders, and another to the throat if requisite: thus a more useful effect is observed to follow, than if both had been applied at the same time.

In the cynanche parotidea, a connexion has been observed between the seat of this disease in males, and the testicles; so that a translation of the morbid action often takes place to the last named part. In this case, a blister to the scrotum has been found to obviate the absorption of that body. I mention this upon the authority of Dr. Guthrie, who afferts that a blister over the part affected will prevent the absorption of the testes from the mumps, when this disease attacks those organs. I have not the least doubt of the fact, though my experience does not enable me to add my testimony to it.

I cannot but digrefs here and observe, that in those obstinate swellings of the testes, which often occur after the gonorrheal discharge ceases suddenly to flow, a blister over the part promises to be attended with much benefit. And when we restect on the liability of these bodies to become schirrous by the action of disease, we can offer no reasonable objection against its being applied.

In exantbematous fevers, blifters are highly necesfary, and are almost always followed by favourable confequences. This is particularly the case, when they are attended by fymptoms of a comatofe nature. In the fmall-pox, of the malignant form, after its violence has been fubdued by purfuing the antiphlogistic plan, or after the disease has continued for fome days, blifters should be applied successively to different parts of the body, without regard being paid to the number of the pustules. But they are particularly ferviceable in this disease, when attended by a state of difficult deglutition, great heat in the mouth and throat, and a fense of fulness in the nostrils. In this case, greater benefit feems to arise from their application to the external fauces. In small-pox, from inoculation, blisters are seldom or never required. But in children, when the convulfions, which often precede the eruption of this disease become inordinate, blisters are of infinite service, and should ever be employed. They are recommended to be applied to the extremities. Would not greater advantages arife from bliftering the back in all cases of convulsions?

In the measles, blisters after bleeding, &c. are much commended, and very justly, for the relief of the dypsnæa, which accompanies this disease. The occurence of opthalmia and phthisis, which often succeed this complaint, is obviated by their action. They should be applied to the side, or between the shoulders.

In the fcarlatina anginofa, blifters have been productive of much good; though Dr. Withering objects against their use. The Doctor, however, confesses, that when the inflammation was less generally diffused over the whole system, they were less detrimental: an indication that his want of success, arose from their improper and untimely application. Dr. Rush, when this disease was prevalent in this city, in the years 1783 and 4, always found evident advantage from the use of blisters. He applied them to the neck or behind the cars.

In pneumonia, the efficacy of blifters is truly certain. They ought not, however, to be applied till after two or three bleedings, unless in moderate cases, and then after a large bleeding, one may be laid over that part which the patient most complains of. It was in this way Sir John Pringle cured many pleurisses. Blisters are particularly serviceable in the pneumonia notha. The congestion, under which the respiratory organs labour in this disease, is most effectually relieved by the application of a large blister to the thorax. Dr. Barton has great considence in blistering, in this formidable complaint.

Dr. Rush also speaks highly of its efficacy. Next to blood-letting, it is certainly the most powerful remedy.

In the incipient stage of phthisis, or after its complete formation, blifters are of infinite utility. In the first case, they frequently stop its progress; and in the next, they afford confiderable relief as palliatives. They lessen the cough and expectoration, and render the respiration more equable, during their action. They often induce fleep. The repeated application of them in this disease, appears to be attended with more advantage than a perpetual one. I am inclined to adopt this opinion, from the principles laid down in this effay, and from having heard of a cafe of confirmed confumption, which was cured by purfuing fuch a plan. Blifters in this affection produce more certain effects when applied to the thorax. In the influenza also, blifters are highly ferviceable. Dr. I. C. Smyth, in a paper published in the first volume, I think, of the Medical Communications, speaks much in the praise of them. He found them to relieve the stitches in the side, and the dypfnœa. He applied them as near as possible to the part affected. Dr. Sydenham likewise commends the use of blisters in this disease.

In afthma, blifters are often employed with very great advantage. That fense of suffocation which is its attendant, is sensibly and quickly lessened by the artificial excitement they create. Their application to the thorax, in all cases, appears most commendable. But if, as is supposed by Dr. Wistar,

the *spafmodic* asthma depends upon an affection of the trachea, blistering the throat promises more benefit.

With refpect to the use of blisters in apoplexy, I have little to say. Nearly all writers recommend them. Dr. Cullen prefers their application to the head. But would not greater benefit be experienced from them, when applied to the extremities? The contrary opinion of their superior efficacy, when applied to the head, appears to be sounded on the ancient hypothesis of a transpiration from the brain, by means of the sutures.

In palfy, great effects have been experienced from the use of blisters, in creating a return of sensation to those parts which were before insensible. They should be often applied to derive the most benefit from them. As soon, therefore, as one ceases to discharge and begins to heal, apply another, and so on, alternately. Perseverance is often paramount to every difficulty. I have not the least doubt of the success that would attend such a practice.

In epilepsy, the use of blisters is too much neglected. I am persuaded, that a continued repetition of them, would be of as evident utility in this disease, as in the preceding. At least, we can but make the experiment. But this is not a mere matter of opinion. Dr. Mead, in his learned treatise, "De imperio solis et lunæ" furnishes us with a case of epilepsy, cured by the application of a blister. When this disease is preceded by the aura

epileptica, blistering the legs feems most advisable. I hinted at this formerly.

In mania, Dr. Mead thinks blisters do more harm than good. But Dr. Cullen found them to be useful when applied to the head. Their efficacy greatly depends upon the time when they are applied. If applied in recent cases of this disease, with considerable action, they are certainly injurious; but if applied after that action has been lessened by the usual remedies, they do much good, and may be employed with obvious benefit. In the atonic state, they ought never to be neglected. Great service will accrue from their use. Their application to the head or shoulders, seem most commendable; but in the tonic state, they should be applied to the extremities. This practice is very properly recommended by Dr. Rush.

In gout, blisters are very effectual in relieving a paroxysm of the disease; but they sometimes render it retrocedent. This can only happen, however, when the gouty action is too great to be concentrated or transcended by the action of vesicatories. Blisters, therefore, should not be employed when the pulse indicates the propriety of blood-letting. When the gout becomes irregular, attacking other parts of the system, instead of fixing itself in the extremities, the best resource is to re-invite its action to its original seat, by blistering. This mode of practice, is fanctioned by Dr. Cullen and others.

The use of blisters in nephritis does not appear to be admissible, in any case, from the sympathetic action they produce in the urinary system. Mustard, however, and similar applications may be used with considerable advantage. They produce the same good effects without a specific determination to the same parts.

In rheumatism, when the pain affects a particular part, blifters do much service; and should always be had recourse to. They create a diversion of the diseased action, and thereby mitigate those acute sensations of pain, and that stiffness, which attend this disease. They should be applied over the part complained of, and repeated as often as occasion may require.

Blifters are of eminent fervice in ophthalmia, or inflammation of the eyes, after the usual remedies have been employed. To produce the most falutary effect, they should be applied behind the ears or between the shoulders.

The bark of the mezerion, which vesicates, when applied to the legs, has been found of service in this complaint. Dr. Barton thinks it more efficacious than epispastics.

Blisters may be advantageously used in many other diseases, and particularly in those of a local nature; but it does not comport with the limits of this essay, nor is it necessary to inquire farther into the subject. The propriety of their application must be left to

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the judgment of every practitioner, who will be regulated undoubtedly by the circumstances of the case in which he wishes to prescribe them.

Internally the efficacy of cantharides is truly valuable when skilfully managed. They have been employed with great fuccess by many physicians, in the cure of various diffressing complaints-their powers in this respect appear to be too much overlooked. Many difeases, that now baffle our utmost skill, might probably give way to its internal exhibition, fo as to admit of the employment of other remedies. Groenvelt employed them fuccessfully in droppies, and in obstinate suppressions of urine. Dr. Mead recommends them strongly in cases of obstinate gleets; and speaks highly of their use in leprous diforders. The tincture of cantharides has been given with advantage in the pertuffis or hooping cough; and it has been lately employed with some success in pleurisses, by a practitioner in Maryland. In abstma alfo, it has been used with benefit. But it appears to be of particular fervice in the diabetes. Morton thinks it a specific. And when we recall to our mind its specific action on the urinary system, we cannot but concur fo far with the Doctor, that it is greatly efficacious. Dr. Gottlieb Richter feems to be of the fame opinion, and thinks it may be often used with advantage. Dr. Brisbane has related feveral cases of diabetes, that were cured by its use.

With this I finish the consideration of the subject of cantharides—a subject no less interesting than it is important. I regret that it is not more worthy of the public eye. Necessity obliged me to touch but lightly on many parts, that admitted great scope for observation; and altogether to pass over others equally relevant to the subject. But I shall console myself with the reslection, that the truly generous mind will ever view with indulgence the tender fruit of youthful acquirements.

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